

REMARKS

The present application was filed on August 7, 2003 with claims 1 through 18. Claims 1 through 18 are presently pending in the above-identified patent application. Claims 4-7 and 13-16 are proposed to be amended herein.

5 In the Office Action, the Examiner reminded Applicant that the abstract should contain proper language and be in the proper format. The Examiner objected to claims 4-7 and 13-16 due to indicated informalities. The Examiner also rejected claims 1 and 8-9 under 35 U.S.C. §102(e) as being anticipated by Englebrecht (United States Patent No. 5,912,917), rejected claim 10 under 35 U.S.C. §102(e) as being anticipated by Kroeger et al. (United States  
10 Patent No. 6,178,317), rejected claims 2-7 under 35 U.S.C. §103(a) as being unpatentable over Englebrecht in view of Kroeger et al. (United States Patent Number 6,430,227), rejected claims 11, 13-14, and 16 under 35 U.S.C. §103(a) as being unpatentable over Kroeger ('317) in view of Kroeger ('227), rejected claims 17-18 under 35 U.S.C. §103(a) as being unpatentable over Kroeger ('317) in view of Englebrecht, and rejected claims 12 and 15 under 35 U.S.C. §103(a) as  
15 being unpatentable over Kroeger ('317 and '227) as applied to claim 11, and further in view of Englebrecht.

ArgumentsFormal Objections

20 The Examiner reminded Applicant that the abstract should contain proper language and be in the proper format. Claims 4-7 and 13-16 have been objected to because the abbreviation "IBOC" recited in claims 4-7 and 13-16 should be changed to "IBOC (In-Band-On-Channel)."

The Abstract and claims 4-7 and 13-16 have been amended to address the Examiner's concerns. Applicants respectfully request that the objections to the Abstract and the  
25 cited claims be withdrawn.

Independent Claim 1

Claim 1 is rejected under 35 U.S.C. §102(e) as being anticipated by Englebrecht. The Examiner asserts that Englebrecht discloses a method of transmitting a plurality of sub-streams in a multi-stream digital audio broadcasting (DAB) system including the step of

allocating a unique frequency partition to each of said sub-streams (program channel; F1-F25, FIG. 3).

Applicants note that Englebrecht teaches to allocate multiple frequency partitions to each of the sub-streams. Referring to Figure 3, Englebrecht teaches to allocate frequency partitions F<sub>1</sub>, F<sub>20</sub>, F<sub>5</sub>, F<sub>24</sub>, F<sub>2</sub>, F<sub>21</sub>, F<sub>4</sub>, F<sub>25</sub>, F<sub>8</sub>, and F<sub>21</sub> to sub-stream “A.” According to Englebrecht, “A” represents program data for channel A and is transmitted on frequency 1 during time slot T1. During the next interval, the program channel for A is transmitted on a new frequency (in the example, on frequency 20).” (Col. 3, lines 29-33.) By contrast, independent claim 1 requires assigning a “unique frequency partition to each of said sub-streams for a plurality of consecutive time slots.” Thus, Englebrecht teaches away from the present invention by teaching to vary the frequency partitions for each consecutive time slot.

Applicants also note that Englebrecht *teaches away* from the present invention by teaching to allocate multiple time slots to each of the sub-streams. Referring to Figure 4, data from Data Block 1 is distributed to Data Blocks 1 through N. Similarly, the data from each of Data Block 2 through N are distributed to Data Blocks 1 through N. This is not the case in independent claim 1 (and independent claim 10) which requires allocating a unique time slot to each of the sub-streams.

Thus, Englebrecht does not disclose or suggest “allocating a unique frequency partition to each of said sub-streams for a plurality of consecutive time slots,” as required by independent claim 1 and does not disclose or suggest allocating a unique time slot to each of said sub-streams, as required by independent claims 1 and 10.

#### Independent Claim 10

Independent claim 10 is rejected under 35 U.S.C. §102(e) as being anticipated by Kroeger ('317). The Examiner asserts that Kroeger ('317) discloses, in Figures 1, 3, and 4, a transmitter in a multi-stream digital audio broadcasting (DAB) system, including a delay circuit 116 for allocating a unique time slot to each of said sub-streams.

Applicants note that Kroeger ('317) teaches to transmit sub-streams (signals) continuously. The output of the delay circuit 116, the output 165 of the Modulator 164, and the output 163 of the Modulator 160 are all signals continuous in time. There are no time slots for

transmitted signals and there is no mechanism for allocating time slots in the transmitter.

Kroeger ('317) discloses that a single audio signal 112 from a source 110 is digitally encoded 122 to create a *single digitally encoded stream* 124. The single digitally encoded stream is then “coupled to the modulator 160, wherein a predetermined number of bits are modulated onto each of the plurality of subcarriers.” (Col. 6, lines 62-65.) The single encoded stream 124 is not allocated a unique time slot because there are no time slots in Kroeger ('317). By contrast, independent claim 10 requires “allocating a unique time slot to each of said two or more sub-streams.”

Kroeger ('317) addresses the transmission of a redundant, *continuous* DAB signal. (Col. 7, lines 65-67.) The redundant signal and the primary signal are continuous in time and therefore do not contain time slots, as would be apparent to a person of ordinary skill in the art.

Thus, Kroeger ('317) does not disclose or suggest allocating a unique time slot to each of said sub-streams, as required by independent claims 1 and 10.

#### Claims 6 and 11

Claim 6 is rejected under 35 U.S.C. §103(a) as being unpatentable over Englebrecht in view of Kroeger et al., and claim 11 is rejected under 35 U.S.C. §103(a) as being unpatentable over Kroeger ('317) in view of Kroeger ('227). Regarding claim 6, the Examiner acknowledges that Englebrecht does not teach the cited limitation, but asserts that Kroeger '227 discloses that said multi stream digital audio broadcasting (DAB) system is an all digital IBOC system and each of said core sub-streams (40 in FIG. 3) has a maximum separation from one of said enhancement sub-streams (36 in FIG. 3) in the frequency domain, but not a maximum separation from the other enhancement sub-stream (46 in FIG. 4) in the time domain. The Examiner further asserts that Englebrecht discloses in FIGS. 3 and 5 wherein each sub-stream (program channel) has a unique time slot and frequency. The Examiner asserts that it would have been obvious to apply Kroeger's teaching ('227) of enhancement and core sub-streams into Englebrecht's system wherein sub-stream being separated in time.

First, Applicants could find no suggestion or disclosure in Kroeger '227 that said multi stream digital audio broadcasting (DAB) system is an all digital IBOC system and that

each of said core sub-streams (40 in FIG. 3) has a maximum separation from one of said enhancement sub-streams (36 in FIG. 3) in the frequency domain. In addition, Applicants could find no disclosure or suggestion in either Kroeger '227 or Englebrecht to combine the techniques cited by the Examiner.

5           Thus, Englebrecht, Kroeger ('317), and Kroeger ('227) , alone or in combination, do not disclose or suggest wherein said multi-stream digital audio broadcasting system is an all-digital IBOC (In-Band-On-Channel) system and each of said core sub-streams has a maximum separation from one of said enhancement sub-streams in the frequency domain and a maximum separation from the other enhancement sub-stream in the time domain, as required by claims 6  
10       and 11, as amended.

Additional Cited References

Kroeger ('227) was cited by the Examiner for its disclosure of sub-streams including at least two core streams and at least two enhancement streams having various properties. Applicants note that Kroeger ('227) does not address the issue of time slots or of  
15       allocating unique time slots. The signals broadcast by Kroeger ('227) are continuous in time.

Thus, Kroeger ('227) does not disclose or suggest allocating a unique time slot to each of said sub-streams, as required by independent claims 1 and 10.

Dependent Claims 2-9 and 11-18

Dependent claims 2-7 are rejected under 35 U.S.C. §103(a) as being unpatentable  
20       over Englebrecht in view of Kroeger ('227), dependent claims 8-9 are rejected under 35 U.S.C. §102(e) as being anticipated by Englebrecht, dependent claims 11, 13-14, and 16 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kroeger ('317) in view of Kroeger ('227), dependent claims 17-18 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kroeger ('317) in view of Englebrecht and dependent claims 12 and 15 are rejected under 35 U.S.C.  
25       §103(a) as being unpatentable over Kroeger ('317 and '227), and further in view of Englebrecht.

Claims 2-9 and 11-18 are dependent on claims 1 and 10, respectively, and are therefore patentably distinguished over Englebrecht, Kroeger ('317), and Kroeger ('227) (alone or in any combination) because of their dependency from independent claims 1 or 10, for the reasons set forth above, as well as other elements these claims adds in combination to their base

claim.

All of the pending claims, i.e., claims 1-18, are in condition for allowance and such favorable action is earnestly solicited.

If any outstanding issues remain, or if the Examiner has any further suggestions for expediting allowance of this application, the Examiner is invited to contact the undersigned at the telephone number indicated below.

The Examiner's attention to this matter is appreciated.

Respectfully submitted,



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